RALGRO AND STILBESTROL IMPLANTS FOR BEEF CATTLE

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The idea of implanting steers to enhance growth and feed efficiency on grass or in the feedlot is not new. Diethylstilbestrol (DES) implants have been used for years under various conditions. In recent years several other implants have been developed for growth improvement in steers. RAL 1/ (resorcylic acid Lactone) or Zearalanol is a growth promotant which was originally isolated from moldy corn. It is classified as a protein anabolic agent rather than a synthetic hormone. Since RAL is not a reproductive hormone many people feel that it does not have the undesirable side effects sometimes associated with DES.

This series of experiments was initiated to study these implants in steer cattle in various stages of production both during the grazing season and also in drylot.

EXPERIMENTAL PROCEDURE

Experiment 1. Fifty-two head of suckling fall-born steers were used in this study from April 14 to July 28, 1971. The calves grazed with their dams in approximately 2000 acre pastures on the Squaw Butte summer range. Twenty-eight steers were on a range which contained a creep feeder and the other 24 steers were on a range without the creep feed (the creep feeding portion of this study is recorded elsewhere in this report). Approximately one-half of the steers were implanted with 36 mg. RAL at the initiation of the 107-day study with the other half receiving a 12 mg. implant of DES. Steers were all allotted to treatments on the basis of body weight.

The calf creep was set-up near the water located in the pasture. Loose salt and salt-bonemeal mixtures were available near the water at all times in both pastures. The cattle were gathered every 28 days and weighed at the Station headquarters under as nearly the same weighing conditions each time as practical. This study was concluded when the calves were weaned on July 28.

Experiment 2. One hundred and twelve yearling steers grazing crested wheatgrass pastures on the Squaw Butte Range Station were used in this study. Implant treatments were either 12 mg. of DES or 36 mg. RAL implanted in each steer. Implant treatments were randomly assigned by stratifying across weight and previous treatment. All steers grazed a common crested wheatgrass pasture and were fed a supplement daily in portable wooden bunks. The supplement composition and feeding regimen is shown in Table 1.

All steers were weighed initially and at 28-day intervals after an overnight restriction from water. Portable weighing facilities were set-up in the pasture for intermediate weights to avoid long drives to the main experiment station scale. Both initial and final weights were taken on the same permanent scale at headquarters.

1/ Zearalanol (RAL) is sold by the Commercial Solvents Corporation under the trade name of Ralgro.

Table 1. Nitrogen energy supplementation levels for different periods during the grazing season

Period	Nitrogen	Digestible energy	Barley	Biuret
	(g./hd./day)	(kcal./hd./day)	(lb.)	(lb.)
May 2-8	8.7	1560	1.00	-----
9-15	8.7	1560	1.00	-----
16-22	8.7	1560	1.00	-----
23-29	8.7	1560	1.00	-----
May 30 - June 5	6.5	1170	0.75	-----
June 6-12	4.4	780	0.50	-----
13-19	9.7	750	0.48	0.03
20-26	17.2	1120	0.70	0.06
June 27 - July 3	23.2	1420	0.91	0.09
July 4-10	26.5	1800	1.13	0.11
11-17	36.2	2390	1.50	0.13
18-24	36.2	2390	1.50	0.13
25-31	46.3	3550	2.23	0.16

Fresh water was hauled daily with salt and a salt bonemeal mixture being available at all times. Observations were made daily for possible side effects or unusual movements of cattle during the summer. This study was conducted over a 78-day period from May 4 until July 20, 1971.

Experiment 3. Experiment 3 involved 60 head of steers part of which were used in Experiment 1 for the growing phase for these fall-born calves. The calves were weaned on August 29 and placed in a weaning lot for a two week period to allow the calves to become adjusted following weaning. During this time the calves were fed loose meadow hay. The steers were then switched from plain meadow hay to their experimental ration consisting of 4.5 pounds of a barley and biuret mixture (barley 978 pounds and Kedlor 22 pounds) plus ad lib feeding of hay (about 80% meadow and 20% alfalfa hay) during this period.

On September 9 the calves were allotted to three treatments consisting of an implant of 12 mg. DES, 36 mg. RAL, or a control with no implant. The cattle receiving implants received the same implant as received during the summer growing period. Allotment for the control animals was done on a random selection basis from the original treatment groups.

The calves were fed in pens with concrete bunks. Fresh water, salt and a salt bonemeal mixture were available at all times. The cattle remained on this growing study for 112 days from September 9 to December 30. The cattle were initially in two lots (30/lot) and were placed in four lots (15/lot) as lot space became available.

The animals were weighed initially and on 28-day intervals after an overnight shrink from water.

Experiment 4. Forty-five steers were allotted on the basis of weight to one of three implant treatments. The treatments were: 24 mg. of DES, 36 mg. of RAL, and a nonimplanted control. The steers were assigned pens by separating all steers into 3 weight groups and then allotting these 15 into the 3 treatments.

These steers were placed in pens with concrete bunks and electrically heated waterers. Salt and a salt-bonemeal mixture were supplied free choice in the lots at all times. Cattle were fed twice daily with the amount being regulated by consumption. Individual weights were obtained at the initiation of the study and at 28-day intervals after an overnight restriction from water.

The ration shown below was fed with long hay until the latter part of the feeding period when it was removed (Table 2).

Table 2. Experimental ration

Ingredient	lb./ton
Barley	1653
Hay	200
Urea	10
Molasses	100
Salt	20
Limestone	17
Trace Minerals	227 g.
TM10 1/	340 g.
Vitamin A (20,000 IU/day)	75 g.

1/ TM10 - Terramycin supplied at the rate of 75 mg./head/day

The steers were started on a high roughage ration and the hay slowly being lowered until the animals were on full feed. Feeding was initiated on September 15 and continued for 152 days. Carcass information is not available at this date. Statistical analysis was analysis of variance with differences between means tested using Duncan's new multiple range test.

RESULTS AND DISCUSSION

Experiment 1. Table 3 shows the results from Experiment 1. No difference in average daily gain was observed between calves implanted with RAL or DES (2.12 versus 2.14 pounds per day). Response was similar for both creeped and noncreeped calves. There were no side effects noticed in either group of implanted calves.

Experiment 2. The experiment was conducted over a 78-day grazing period from May 4 until July 20. One hundred and twelve animals were used in this study, summarization of which is presented in Table 4.

Table 3. Experimental results - Experiment 1 - Fall-born calves

Treatment	No.	Start wt.	Final wt.	Gain	ADG
		(lb.)	(lb.)	(lb.)	(lb./day)
RAL-creep	13	311	566	255	2.38
RAL-no creep	12	256	454	198	1.85
DES-creep	15	312	567	255	2.38
DES-no creep	12	261	465	204	1.91

Table 4. Experimental results - Experiment 2 - Grazing steers

Treatment	No.	Start wt.	Final wt.	Gain	ADG
		(lb.)	(lb.)	(lb.)	(lb./day)
RAL	56	557	811	254	3.25
DES	56	558	797	239	3.06

Although not statistically different, steers implanted with Ralgro outperform Stilbestrol implanted steers by 6.2% in average daily gain throughout the 78-day grazing period. The 15 pounds more total gain made by the Ralgro implanted cattle, if valued at 30 cents, would be a $4.50 return over the Stilbestrol implanted cattle. In this experiment Ralgro more than paid for itself over Stilbestrol. No side effects were noted with either implant treatment.

Over the 78-day period these steers were supplemented a total of 75 pounds of barley and 3.3 pounds of biuret. This would result in a feed only cost of about $2.43, resulting in a cost of gain $.0096 per pound of gain for the Ralgro cattle and $.01 per pound of gain for the Stilbestrol cattle. Labor cost was not included in this analysis but is estimated that about one hour per day was required to supplement the animals. Hauling, equipment, and pasture expense should be added in as it fits the individual situation.

Experiment 3. An implant study with growing steers was conducted for 112 days with results being presented in Table 5.

Gain from implanted growing steers was 60% greater than control steers. Daily gains were lower than expected due to several management problems existing in the cattle. Parts of the alfalfa hay were moldy resulting in some digestive upsets, coupled with crowded lot conditions and some periods of extremely muddy lots, held animal gains down. No side effects from the implants were noted.

Table 5. Experimental results - Experiment 3 - Growing steers

Treatment	No.	Start wt.	Final wt.	Gain	ADG	% over control
		(lb.)	(lb.)	(lb.)	(lb./day)	
RAL 36 mg.	21	527	667	140	1.25	60
DES 12 mg.	18	510	661	141	1.25	60
Control	21	546	633	87	0.78	--

Experiment 4. An implant comparison study was conducted for 152 days on finishing steers with the results summarized in Table 6.

Table 6. Experimental results - Experiment 4 - Finishing steers

Treatment	No.	Start wt.	Final wt.	Gain	ADG	% over control
		(lb.)	(lb.)	(lb.)	(lb./day)	
DES	15	806	1127	321	2.11	27.7
RAL	15	820	1087	267	1.76	6.0
Control	15	807	1059	252	1.66	----

These cattle were held on feed until it was felt that about 3/4 of the carcasses would grade choice. Poor gains can possibly be attributed to the long winter coupled with extremely muddy lot conditions and rather low intake of the 90% concentrate ration (average 20 lb./day intake).

Both implant treatments outperformed the controls. However, the difference between the RAL implanted cattle and the controls was not significantly different. The DES implanted cattle significantly ($P < 0.01$) outgained both other treatments.

CONCLUSIONS

It appears from these experiments that cattle should be implanted both in a growing stage as well as during the finishing period. In the comparison of RAL to DES, there does not appear to be a distinct advantage to either during the growing period. It should be kept in mind that side effects sometimes occur on cattle implanted with DES but which do not gain well. Therefore, a rancher that implants in the spring is assuming the grass will be adequate to support good gains,

if the grass fails and the cattle do not gain then side effects may show up. RAL may have an advantage here since side effects are not a problem even if the cattle do not gain as expected.

In light of research at other Experiment Stations it is felt that more data concerning implants during the finishing period needs to be developed before a conclusion can be made.

THE VALUE OF QUALITY HAY FOR WEANER CALVES

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As the practice of warm-up operations in growing lots for cattle destined for the feedlot becomes more popular, so does the increased use of alfalfa hay. There has been an increased use of alfalfa in the intermountain area of the west. Much of this increase can be attributed to the fact that good gain can be supported on alfalfa hay alone. The work by the Nevada Experiment Station indicates that good hay produced in the intermountain area is of a quality capable of supporting gains approaching 2 pounds per head per day. This is higher than often thought possible and can be accomplished on 100% alfalfa without serious bloat losses if good management is applied.

In 1968, the Squaw Butte Experiment Station drained 60 acres of meadow land at Section 5, drilled an irrigation well and planted alfalfa to study the various aspects of producing alfalfa on these lands. This report is the evaluation of different quality hay on the performance of weaner calves.

EXPERIMENTAL PROCEDURE

Three qualities of alfalfa hay were produced by cutting the hay at varying stages of growth. The 1/10 bloom was cut when 10% of the flowering head is in bloom. This is generally recognized by many producers as the time to cut alfalfa. The late bud alfalfa was cut just as the blooms were about ready to emerge. The bud stage was cut when the buds were well formed. This is also the point where tiller growth is well started at the base of the plant but not high enough to be cut by the mower (1 to 2 inches). The other hay types were mixtures of grass and alfalfa (mostly alfalfa) or grass and clover (mostly grass) cut at the regular time. The meadow hay was part of the regular hay crop put up in July.

The hays were analyzed for chemical constituents which could indicate their quality, e.g. protein, acid detergent fiber (ADF), crude fiber and total digestible nutrients (TDN). These figures are presented in Table 1. It should be pointed out that no single chemical constituent can be used to estimate the quality of a hay and, even in combination, may be inadequate. In general, the higher the protein, the lower the fiber constituents and the higher the TDN values, the higher the quality of the hay. This is more applicable to alfalfa hay than to the grass hays.